

# MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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## INTRODUCTION.

The MONTHLY WEATHER REVIEW for November, 1901, is based on reports from about 3,100 stations furnished by employees and voluntary observers, classified as follows: regular stations of the Weather Bureau, 159; West Indian service stations, 13; special river stations, 132; special rainfall stations, 48; voluntary observers of the Weather Bureau, 2,562; Army post hospital reports, 18; United States Life-Saving Service, 9; Southern Pacific Railway Company, 96; Hawaiian Government Survey, 200; Canadian Meteorological Service, 32; Jamaica Weather Office, 160; Mexican Telegraph Service, 20; Mexican voluntary stations, 7; Mexican Telegraph Company, 3; Costa Rican Service, 7. International simultaneous observations are received from a few stations and used, together with trustworthy newspaper extracts and special reports.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. Curtis J. Lyons, Meteorologist to the Hawaiian Government Survey, Honolulu; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Mr. Maxwell Hall, Government Meteorologist, Kingston, Jamaica; Capt. S. I. Kimball, Superintendent of the United States Life-Saving Service; Lieut.-Commander W. H. H. Southerland, Hydrographer, United States Navy; H. Pittier, Director of the Physico-Geographic Institute, San Jose, Costa Rica; Capt. François S. Chaves, Director of the Meteorological Observatory, Ponta

Delgada, St. Michaels, Azores, and W. M. Shaw, Esq., Secretary, Meteorological Office, London; Rev. Josef Algué, S. J., Director, Philippine Weather Service.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. The Hawaiian standard meridian is  $157^{\circ} 30'$ , or  $10^{\text{h}} 30^{\text{m}}$  west of Greenwich. The Costa Rican standard of time is that of San Jose,  $0^{\text{h}} 36^{\text{m}} 13^{\text{s}}$  slower than seventy-fifth meridian time, corresponding to  $5^{\text{h}} 36^{\text{m}}$  west of Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local standard is mentioned.

Barometric pressures, whether "station pressures" or "sea-level pressures," are now always reduced to standard gravity, so that they express pressure in a standard system of absolute measures.

During the temporary absence of Professor Abbe, Mr. H. H. Kimball has been designated Acting Editor of the REVIEW.

## FORECASTS AND WARNINGS.

By Prof. E. B. GARRETT, in charge of Forecast Division.

The month opened with a storm of tropical origin central north of Porto Rico. At 11:10 a. m. of the 1st the following message was telegraphed the Weather Bureau offices at Hamilton, Bermuda; New York, N. Y.; Philadelphia, Pa., and Boston, Mass.:

Severe disturbance moving northward east of Turks Island will probably pass near Bermuda Saturday.

The following article from The Bermuda Colonist, of November 6, 1901, verifies the accuracy of the advices furnished:

### THE LATE STORM.

The hurricane that was predicted by the Washington Weather Bureau for Saturday, arrived on time and raged around the islands for twenty-four hours. All the incoming steamers were delayed, in consequence, and those that were southward bound, the New York mail steamer especially, experienced exceedingly heavy weather.

The growing crops throughout the colony have suffered somewhat and the storm damage to property has been considerable. The principal damage reported has been occasioned to government property about the islands in the Great Sound, where the prisoners of war are interned, and it is said that the preliminary estimate of the damage reaches the sum of £2,000.

Reports from the westward state that the contractors for the dock-yard extension works have also sustained some loss; a large boat used

for conveying laborers to and fro between the old Terror and the shore foundered and a large quantity of baulk timber got adrift.

Atlantic coast shipping interests were notified on the 2d that a severe tropical storm was moving northeast near Bermuda, and similar advices were cabled to London, England.

From the 2d to the 5th the storm center moved northeastward over mid ocean attended by gales of great violence. There is no evidence that this storm reached the European coast. It appeared rather to gradually lose intensity over mid ocean from the 6th until the 8th, when depressions appeared, respectively, over the North Sea and near the Azores. In the meantime a disturbance of moderate strength had moved eastward over the Canadian Maritime Provinces, and during the 9th, passed to the southeast of Newfoundland. It is possible that this depression is identical with the severe storm that moved eastward over the British Isles during the 12th and 13th, and passed thence over the continent.

North Atlantic shipping interests were kept fully advised regarding storms which visited the western part of the ocean, and forecasts of the wind and the weather for the first three days out of steamers sailing east from American ports were issued daily.

The following letter, dated November 15, 1901, addressed by the secretary of Lloyd's, London, to the Chief of the United States Weather Bureau at Washington, indicates the degree of interest that is being taken in the Weather Bureau warnings by representatives of the commercial and shipping interests of the North Atlantic.

I am instructed to express to you the best thanks of the Committee of Lloyd's for the forecasts of bad weather in the Atlantic with which you have been so good as to allow them to be favored, and I am desired to convey to you the congratulations of my Committee on the infallibility of the predictions that have been supplied by these forecasts.

The most important storm of the month along the Atlantic seaboard of the United States began the night of the 23d and continued during the 24th.

The following special bulletin, issued from Washington on the 25th, indicates the general character of this storm, and of the action taken to issue warnings in connection therewith:

The severe storm that visited the Middle Atlantic and New England coasts Saturday night and Sunday, and which continued on the New England coast Monday, was most severely felt from New York to Boston, where maximum wind velocities ranging from 60 to 86 miles an hour from the northeast were reported Sunday.

Timely warning was given by the Weather Bureau of the approach of this storm, and before 1 p. m. Saturday, coast and shipping interests from Maine to Florida had been informed regarding its position, character, and course, and storm warnings had been ordered from Hatteras to Eastport. Monday morning Lloyd's, London, were cabled from Washington that a severe storm would pass over Newfoundland Monday night, moving northeast.

Commenting upon the storm, an article in the Boston Journal, of November 25, 1901, reads as follows:

#### AMPLE WARNING WAS GIVEN.

The Weather Bureau, whose timely warning has saved uncounted ships and their crews from the storm, predicts that the disturbance will pass away to-day, and that Tuesday morning the weather will be fair.

There had been plenty of warning of this storm. Early Saturday the storm signals had been hoisted on the Federal Building, and they were kept flying, and every good sailor saw that it was wise to have everything snug and safe aloft and alow, so the storm found nothing in the harbor to meddle with. As the wind kept coming fresher out of the north, some of the big vessels in the stream put down two hooks into the mud, and when the wind was blowing its strongest, 60 miles an hour, in the afternoon of yesterday, all the vessels were riding as prettily as if it were nothing but the ebbing tide which had slewed them round so that their bowsprits were writing words on the sky toward East Boston.

It was a coincidence of comment that this storm had come in the same way and at the same time as that terrible storm of 1898, when the steamer *Portland* was lost. This time, however, the lesson did not require a second teaching.

Several storms of seasonal intensity crossed the Great Lakes. Ample warnings were issued in advance of these storms and shipmasters generally profited by them.

A number of severe storms were reported on the British Columbia and Alaska coasts, and on the 28th a severe storm, for which warnings were displayed on the 27th, visited the middle California coast.

The first important cold wave of the month appeared over the British Northwest Territory on the morning of the 2d, extended over districts lying between the Mississippi River and the Rocky Mountains during the 3d, and caused heavy frosts in the Ohio Valley and the interior of the Southern States during the night of the 4th. The second cold wave of the month appeared in the extreme Northwest on the 6th, and extended southeast and east with rapidly diminishing intensity during the 7th and 8th.

Frost was reported in the Southern States on several dates, and in each instance its occurrence was anticipated in the forecasts or by special frost warnings.

The snowfalls of the month were unusually heavy for the season in the mountain districts of the Middle and North Atlantic States. The first heavy snowstorm occurred on the

13th and 14th, and extended from northern New England and the interior of New York to western Virginia. On the 19th, snow was reported in northern Georgia, and on the 24th heavy snow fell in the middle Allegheny Mountain districts.

Heavy rains from the 23d to 26th caused a marked rise in the head waters of the Ohio River. The value of the River and Flood Service of the Weather Bureau in forecasting marked changes in river stages is indicated by the following extract from the Pittsburgh Despatch of November 27, 1901:

#### VALUABLE TO COAL COMPANIES.

That the value and importance of the local weather office service to the river interests can not be fully calculated was demonstrated on this rise.

Mr. Ridgeway had the information in advance of anyone else that a coal-boat stage of water would reach the upper Ohio River by Monday afternoon. At least thirty hours in advance of the crest of the rise he had officially notified the different coal interests here of the coming water. He predicted that there would be 12 feet of water, and his prediction has been verified within a few inches.

This valuable information from the Weather Bureau enabled the coal companies to get their fleets in readiness, and by the time shipping water came the steamers all had steam up and only awaited the signal to cut loose. As a result of the notice, many millions of bushels of coal have gone down the Ohio, and more will go to-day. A delay of twenty-four hours, and the indefinite information which would have been received through the regular channels of the coal companies would have broken the back of this great shipment. The great importance of the Weather Bureau to Pittsburgh and its varied interests can not be calculated in dollars and cents, but an idea can be gained of its value through the fact that the notice, by being sent out so far in advance of the rise, gave employment to over five hundred men.

#### BOSTON FORECAST DISTRICT.

The chief meteorological feature of the month was a severe storm on the 24-25th. This storm was of southern origin, and it attained great force along the New England coast. At Block Island the wind reached a maximum velocity of 80 miles an hour. The highest velocity at Boston was 60 miles an hour, and a mean velocity of 44 miles an hour was maintained for a period of six hours. It is estimated that the storm was the most severe since the hurricane of November, 1898. Ample warning was given of the approach of the disturbance, and it is known that much benefit resulted to shipping and other interests. The press of the city commended the Bureau for the excellence of the service rendered. The Boston Evening Transcript of November 25 stated editorially as follows:

Whatever may be the record of the Weather Bureau with respect to the more vaguely defined forecasts, it has rarely made mistakes regarding big events. It sent out warnings previous to all our recent great storms, and had the people of Galveston acted promptly on its suggestions the disaster would have been mitigated somewhat. The warning sent out Saturday and the manner of its reception shows that we have come to entertain a wise respect for scientific forecasting.

The daily forecasts of the month were generally correct and often brought forth favorable comment from interested persons.—*J. W. Smith, Forecast Official.*

#### CHICAGO FORECAST DISTRICT.

A cold wave developed in the extreme Northwest on the 2d and gradually overspread the entire district. A second cold wave appeared in the Northwest on the 6th and moved eastward over the district, with a considerable fall in temperature. Cold-wave warnings were ordered in advance at all stations where marked temperature falls occurred.

A storm of considerable intensity reached the lakes on the 3d, and a second, with increased intensity, on the 6th and 7th. Storm warnings were ordered at all ports in advance of these storms. Warnings were ordered on the 11th for a storm of considerable force, which moved eastward across the lakes.